



## Chemical Composition and Antioxidant Activities of Microencapsulated Rosemary and Clove Essential Oils

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**Abstract :** This study aimed to evaluate the influence of encapsulation by using some carrier materials on chemical compositions and antioxidant activities of rosemary and clove essential oils. Hydrodistillation essential oils (EOs) of rosemary and clove buds were separated and identified. GC and GC-MS identified 24 and 20 components in rosemary and clove EOs representing 94.93 % and 98.02 % of the total rosemary and clove EOs, respectively. The main components of rosemary EO were 1, 8-cineole (30.88%) followed by camphor (22.71%),  $\alpha$ -terpineol (15.01%),  $\alpha$ -pinene (8.78%) and camphene (4.31%). The major compound in the volatile oil of clove buds were Eugenol (81.77%) followed by  $\beta$ -Caryophyllene (5.97%) and eugenol acetate (5.19%). The effect of microencapsulation with some carrier materials (alginate, chitosan, carragenaan and carboxymethyl cellulose) on the chemical composition and antioxidant activities of rosemary and clove EOs were studied. Chitosan was characterized with its higher efficiency for microcapsulated EOs compared to other carrier material. The change in the chemical classes of EOs was observed after encapsulation. Clove EO exhibited a higher antioxidant activity and total phenolic content than rosemary EO. Also, encapsulated clove EO in chitosan and rosemary EOs in alginate exhibited higher antioxidant activity and total phenolic content compared to other investigated encapsulated EOs. After storage for 6 months, all encapsulated EOs exhibited an increase in antioxidant activity and total phenolic content except those encapsulated in alginate and CMC, respectively.

**Keywords:** Clove essential oil; rosemary essential oil; antioxidant activity; GC-MS; microencapsulation.

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